

WHAT IS CLAIMED IS:

1. A distributed printing control apparatus connecting with a plurality of printers, said distributed printing control apparatus distributing
5 print data of interest, which is generated by an application program and is to be printed, into said plurality of printers, converting the distributed print data into output data suitable for each of said printers via a printer driver provided for said each printer, and transmitting the converted output data to said each printer, said distributed printing control apparatus comprising:

10 a virtual printer driver storage module that stores therein a virtual printer driver for specifying information on a virtual printer; and
an intermediate print data generation module that executes the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program,

15 wherein the obtained intermediate print data is used as the print data of interest.

2. A distributed printing control apparatus in accordance with claim 1, wherein the virtual printer driver specifies information with regard to a
20 highest-performance printer among all available printers as destinations of distribution.

3. A distributed printing control apparatus in accordance with claim 2, said distributed printing control apparatus further comprising:

25 a performance information collection module that collects information with regard to performances of all said available printers as the destinations

of distribution from printer drivers individually provided for said available printers; and

a highest performance selection module that selects a highest performance among the performances of all said available printers collected

5 by said performance information collection module.

4. A distributed printing control apparatus in accordance with any one of claims 1 to 3, said distributed printing control apparatus further comprising:

10 a virtual printer printing information setting module that displays an input window on a display device and sets various pieces of information required for printing with said virtual printer, based on input data from an input device like a mouse and a keyboard.

15 5. A distributed printing control apparatus in accordance with claim 4, said distributed printing control apparatus further comprising:

an information transmission module that causes at least part of the various pieces of information set by said virtual printer printing information setting module to undergo a series of processing carried out by each printer

20 driver.

6. A distributed printing control apparatus in accordance with either one of claims 4 and 5, said distributed printing control apparatus further comprising:

25 a real printer printing information setting module that is individually provided for each of said plurality of printers connected to said distributed

printing control apparatus to set various pieces of information required for printing with said each printer; and

5 a display control module that displays a display window on said display device, the display window including a plurality of icons for individually activating said real printer printing information setting modules and an icon for activating said virtual printer printing information setting module.

10 7. A distributed printing control apparatus in accordance with any one of claims 1 to 6, said distributed printing control apparatus further comprising:

15 a distribution information setting module that displays an input window for distribution of the print data and sets various pieces of information required for distributing the print data into said plurality of printers, based on the input data from said input device; and

a print data distribution module that distributes the print data into said plurality of printers, based on the various pieces of information set by said distribution information setting module.

20 8. A distributed printing control apparatus in accordance with claim 7, wherein one of the various pieces of information required for distributing the print data into said plurality of printers restricts a destination of distribution of the print data to a printer included in a specific group selected among said plurality of printers connected to said distributed printing control apparatus.

25

9. A distributed printing control apparatus in accordance with any

one of claims 1 to 8, wherein the intermediate print data obtained by said intermediate print data generation module is temporarily registered as an intermediate print file in an external storage device.

5 10. A distributed printing control apparatus in accordance with any one of claims 1 to 9, wherein said plurality of printers are connected to said distributed printing control apparatus via a computer network.

10 11. A distributed printing control method that distributes print data of interest, which is generated by an application program and is to be printed, into a plurality of printers, converts the distributed print data into output data suitable for each of said printers via a printer driver provided for said each printer, and transmits the converted output data to said each printer, said distributed printing control method comprising the steps of:

15 (a) providing in advance a virtual printer driver for specifying information on a virtual printer in a storage device; and

 (b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program,

 wherein the obtained intermediate print data is used as the print
20 data of interest.

25 12. A distributed printing control method that distributes print data of interest, which is generated by an application program and is to be printed, into a plurality of printers, converts the distributed print data into output data suitable for each of said printers via a printer driver provided for said each printer, and transmits the converted output data to said each printer,

said distributed printing control method comprising at least one step corresponding to the structure of a distributed printing control apparatus in accordance with any one of claims 2 to 10.

5 13. A computer readable recording medium in which a computer program used in a distributed printing control apparatus is recorded, said distributed printing control apparatus connecting with a plurality of computers, distributing print data of interest, which is generated by an application program and is to be printed, into a plurality of printers,

10 converting the distributed print data into output data suitable for each of said printers via a printer driver provided for said each printer, and transmitting the converted output data to said each printer, said computer program causing a computer to attain the functions of:

15 (a) providing in advance a virtual printer driver for specifying information on a virtual printer in a storage device; and

 (b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program and using the obtained intermediate print data as the print data of interest.

20 14. A computer readable recording medium in accordance with claim 13, wherein the virtual printer driver specifies information with regard to a highest-performance printer among all available printers as destinations of distribution.

25 15. A computer readable recording medium in accordance with claim 14, wherein said computer program further causes the computer to attain the

functions of:

(c) collecting information with regard to performances of all said available printers as the destinations of distribution from printer drivers individually provided for said available printers; and

5 (d) selecting a highest performance among the performances of all said available printers collected by said function (c).

16. A computer readable recording medium in accordance with any one of claims 13 to 15, wherein said computer program further causes the 10 computer to attain the function of:

(e) displaying an input window on a display device and setting various pieces of information required for printing with said virtual printer, based on input data from an input device like a mouse and a keyboard.

15 17. A computer readable recording medium in accordance with claim 16, wherein said computer program further causes the computer to attain the 20 function of:

causing at least part of the various pieces of information set by said function (e) to undergo a series of processing carried out by each printer driver.

18. A computer readable recording medium in accordance with either one of claims 16 and 17, wherein said computer program further causes the computer to attain the functions of:

25 (f) setting various pieces of information required for printing with each of said plurality of printers connected to said distributed printing

control apparatus, said function (f) being individually set for said each printer; and

(g) displaying a display window on said display device, the display window including a plurality of icons for individually activating said 5 functions (f) and an icon for activating said function (e).

19. A computer readable recording medium in which a computer program used in a distributed printing control apparatus is recorded, said distributed printing control apparatus connecting with a plurality of 10 computers, distributing print data of interest, which is generated by an application program and is to be printed, into a plurality of printers, converting the distributed print data into output data suitable for each of said printers via a printer driver provided for said each printer, and transmitting the converted output data to said each printer,

15 said computer program causing a computer to attain at least one function corresponding to the structure of a distributed printing control apparatus in accordance with any one of claims 7 to 10.

20. A computer program that is used in a distributed printing control 20 apparatus, said distributed printing control apparatus connecting with a plurality of computers, distributing print data of interest, which is generated by an application program and is to be printed, into a plurality of printers, converting the distributed print data into output data suitable for each of said printers via a printer driver provided for said each printer, and 25 transmitting the converted output data to said each printer, said computer program causing a computer to attain the functions of:

- (a) providing in advance a virtual printer driver for specifying information on a virtual printer in a storage device; and
- (b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program and
- 5 using the obtained intermediate print data as the print data of interest.

21. A distributed printing control apparatus that distributes print data of interest, which is generated by an application program and is to be printed, into a plurality of printers and outputs the distributed print data to

10 each of said plurality of printers via a printer driver corresponding to a type of said each printer, said distributed printing control apparatus comprising:

15 a virtual printer driver storage module that, when said plurality of printers are of an identical type, stores therein a virtual printer driver for specifying information on the identical type of said printers as information with regard to a virtual printer;

an intermediate print data generation module that executes the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program;

20 a print data allocation module that allocates the intermediate print data to said plurality of printers; and

an output data control module that transmits the intermediate print data respectively to said plurality of printers according to the allocation by said print data allocation module without any data conversion by the corresponding printer driver.

25

22. A distributed printing control apparatus in accordance with claim

21, wherein a predetermined unit of the allocation of the intermediate print data by said print data allocation module is each page of a document expressed by print data.

5 23. A distributed printing control apparatus in accordance with either one of claims 21 and 22, wherein the intermediate print data obtained by said intermediate print data generation module is temporarily registered as an intermediate print file in an external storage device.

10 24. A distributed printing control apparatus in accordance with claim 23, said distributed printing control apparatus reading the intermediate print file registered in said external storage device in response to an external command and re-executing distributed printing of the intermediate print data in the intermediate print file with said plurality of printers.

15 25. A distributed printing control apparatus in accordance with claim 24, wherein said print data allocation module and said output data control module are activated again to attain the re-execution of the distributed printing.

20 26. A distributed printing control apparatus in accordance with any one of claims 21 to 25, said distributed printing control apparatus further comprising:

25 a performance information collecting module that collects information regarding performances of each of said plurality of printers from a printer driver provided for said each printer; and

an identity decision module that determines that said plurality of printers are of the identical type, based on the performances of said plurality of printers collected by said performance information collecting module.

5 27. A distributed printing control apparatus in accordance with any one of claims 21 to 26, said distributed printing control apparatus further comprising:

10 a distribution information setting module that displays an input window for distribution of the print data and sets various pieces of information required for distributing the print data into said plurality of printers, based on input data from an input device,

15 wherein said print data allocation module allocates the intermediate print data, based on the various pieces of information set by said distribution information setting module.

15

28. A distributed printing control apparatus in accordance with claim 27, wherein one of the various pieces of information required for distributing the print data into said plurality of printers restricts a destination of distribution of the print data to a printer included in a specific group selected 20 among said plurality of printers connected to said distributed printing control apparatus.

29. A distributed printing control apparatus in accordance with either one of claims 27 and 28, wherein the intermediate print data obtained by said 25 intermediate print data generation module is specified as an intermediate print file and is temporarily registered, together with the various pieces of

information set by said distribution information setting module, in an external storage device.

30. A distributed printing control apparatus in accordance with any 5 one of claims 21 to 29, wherein at least one of said plurality of printers is connected to said distributed printing control apparatus via a computer network.

31. A distributed printing control apparatus that distributes print 10 data of interest, which is generated by an application program and is to be printed, into a plurality of printers and outputs the distributed print data to each of said plurality of printers via a printer driver corresponding to a type of said each printer, said distributed printing control apparatus comprising:

15 a virtual printer driver storage module that specifies information on a virtual printer, and when said plurality of printers are of an identical type, stores therein a virtual printer driver for specifying information on the identical type of said printers;

20 an intermediate print data generation module that executes the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program;

a print data allocation module that allocates the intermediate print data to said plurality of printers;

an identity decision module that determines whether or not said plurality of printers are of the identical type; and

25 an output data control module that, when it is determined that said plurality of printers are of the identical type, transmits the intermediate

print data respectively to said plurality of printers according to the allocation by said print data allocation module without any data conversion by the corresponding printer driver, and when it is determined that said plurality of printers are not of the identical type, transmits the intermediate print data 5 respectively to said plurality of printers according to the allocation by said print data allocation module with data conversion by the corresponding printer driver.

32. A distributed printing control method that distributes print data 10 of interest, which is generated by an application program and is to be printed, into a plurality of printers and outputs the distributed print data to each of said plurality of printers via a printer driver corresponding to a type of said each printer, said distributed printing control method comprising the steps of:

- (a) when said plurality of printers are of an identical type, providing 15 in advance a virtual printer driver for specifying information on the identical type of said printers as information with regard to a virtual printer in a storage device;
- (b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program;
- 20 (c) allocating the intermediate print data to said plurality of printers; and
- (d) transmitting the intermediate print data respectively to said plurality of printers according to the allocation in said step (c) without any data conversion by the corresponding printer driver.

25

33. A distributed printing control method that distributes print data

of interest, which is generated by an application program and is to be printed, into a plurality of printers and outputs the distributed print data to each of said plurality of printers via a printer driver corresponding to a type of said each printer,

5 said distributed printing control method comprising at least one step corresponding to the structure of a distributed printing control apparatus in accordance with any one of claims 22 to 30.

34. A distributed printing control method that distributes print data
10 of interest, which is generated by an application program and is to be printed, into a plurality of printers and outputs the distributed print data to each of said plurality of printers via a printer driver corresponding to a type of said each printer, said distributed printing control method comprising the steps of:

15 (a) specifying information on a virtual printer, and when said plurality of printers are of an identical type, providing in advance a virtual printer driver for specifying information on the identical type of said printers in a storage device;

 (b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program;

20 (c) allocating the intermediate print data to said plurality of printers;

 (d) determining whether or not said plurality of printers are of the identical type; and

25 (e) when it is determined that said plurality of printers are of the identical type, transmitting the intermediate print data respectively to said plurality of printers according to the allocation in said step (c) without any data conversion by the corresponding printer driver, and when it is

TOC00470303650

determined that said plurality of printers are not of the identical type, transmitting the intermediate print data respectively to said plurality of printers according to the allocation in said step (c) with data conversion by the corresponding printer driver.

5

35. A computer readable recording medium in which a computer program used in a distributed printing control apparatus is recorded, said distributed printing control apparatus distributing print data of interest, which is generated by an application program and is to be printed, into a plurality of printers of an identical type and outputting the distributed print data to each of said plurality of printers via a printer driver provided for said each printer, said computer program causing a computer to attain the functions of:

(a) when said plurality of printers are of the identical type, providing in advance a virtual printer driver for specifying information on the identical type of said printers as information with regard to a virtual printer in a storage device;

(b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program;

20 (c) allocating the intermediate print data to said plurality of printers; and

(d) transmitting the intermediate print data respectively to said plurality of printers according to the allocation by said function (c) without any data conversion by the corresponding printer driver.

25

36. A computer readable recording medium in accordance with claim

TOP SECRET - DT 200660

35, wherein a predetermined unit of the allocation of the intermediate print data by said function (c) is each page of a document expressed by print data.

37. A computer readable recording medium in accordance with either
5 one of claims 35 and 36, wherein the intermediate print data obtained by said function (b) is temporarily registered as an intermediate print file in an external storage device.

38. A computer readable recording medium in accordance with claim
10 37, wherein said computer program causes the computer to attain the function of:

reading the intermediate print file registered in said external storage device in response to an external command and re-executing distributed printing of the intermediate print data in the intermediate print file with
15 said plurality of printers.

39. A computer readable recording medium in accordance with any one of claims 35 to 38, wherein said computer program further causes the computer to attain the functions of:

20 (e) displaying an input window for distribution of the print data and setting various pieces of information required for distributing the print data into said plurality of printers, based on input data from an input device,

where said function (c) allocates the intermediate print data, based on the various pieces of information set in said step (e); and

25 (f) specifying the intermediate print data obtained by said function (b) as an intermediate print file and outputting the intermediate print file

together with the various pieces of information set in said step (e) to an external storage device.

40. A computer readable recording medium in which a computer
5 program used in a distributed printing control apparatus is recorded, said
distributed printing control apparatus distributing print data of interest,
which is generated by an application program and is to be printed, into a
plurality of printers and outputting the distributed print data to each of said
plurality of printers via a printer driver provided for said each printer,
10 said computer program causing a computer to attain at least one
function corresponding to the structure of a distributed printing control
apparatus in accordance with any one of claims 25 to 28 and 30.

41. A computer readable recording medium in which a computer
15 program used in a distributed printing control apparatus is recorded, said
distributed printing control apparatus distributing print data of interest,
which is generated by an application program and is to be printed, into a
plurality of printers and outputting the distributed print data to each of said
plurality of printers via a printer driver corresponding to a type of said each
20 printer, said computer program causing a computer to attain the functions of:
 (a) specifying information on a virtual printer, and when said
plurality of printers are of an identical type, providing in advance a virtual
printer driver for specifying information on the identical type of said printers
in a storage device;
25 (b) executing the virtual printer driver to obtain intermediate print
data adequate for said virtual printer from said application program;

- (c) allocating the intermediate print data to said plurality of printers;
- (d) determining whether or not said plurality of printers are of the identical type; and
- (e) when it is determined that said plurality of printers are of the identical type, transmitting the intermediate print data respectively to said plurality of printers according to the allocation by said function (c) without any data conversion by the corresponding printer driver, and when it is determined that said plurality of printers are not of the identical type, transmitting the intermediate print data respectively to said plurality of printers according to the allocation by said function (c) with data conversion by the corresponding printer driver.

5

10

42. A computer program used in a distributed printing control apparatus, said distributed printing control apparatus distributing print data of interest, which is generated by an application program and is to be printed, into a plurality of printers of an identical type and outputting the distributed print data to each of said plurality of printers via a printer driver provided for said each printer, said computer program causing a computer to attain the functions of:

15

- (a) when said plurality of printers are of the identical type, providing in advance a virtual printer driver for specifying information on the identical type of said printers as information with regard to a virtual printer in a storage device;
- (b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program;
- (c) allocating the intermediate print data to said plurality of printers;

20

25

and

(d) transmitting the intermediate print data respectively to said plurality of printers according to the allocation by said function (c) without any data conversion by the corresponding printer driver.

5

43. A computer program used in a distributed printing control apparatus, said distributed printing control apparatus distributing print data of interest, which is generated by an application program and is to be printed, into a plurality of printers and outputting the distributed print data to each 10 of said plurality of printers via a printer driver corresponding to a type of said each printer, said computer program causing a computer to attain the functions of:

(a) specifying information on a virtual printer, and when said plurality of printers are of an identical type, providing in advance a virtual 15 printer driver for specifying information on the identical type of said printers in a storage device;

(b) executing the virtual printer driver to obtain intermediate print data adequate for said virtual printer from said application program;

(c) allocating the intermediate print data to said plurality of printers;

20 (d) determining whether or not said plurality of printers are of the identical type; and

(e) when it is determined that said plurality of printers are of the identical type, transmitting the intermediate print data respectively to said plurality of printers according to the allocation by said function (c) without 25 any data conversion by the corresponding printer driver, and when it is determined that said plurality of printers are not of the identical type,

TOKUYA-00000000

transmitting the intermediate print data respectively to said plurality of printers according to the allocation by said function (c) with data conversion by the corresponding printer driver.

- 5 44. A distributed printing control apparatus that groups print data of interest, which is to be printed, by a predetermined unit, specifies allocation of respective grouped parts of the print data to a plurality of printers as allocation information, and outputs the print data to said plurality of printers in a distributive manner based on the allocation information, said distributed printing control apparatus comprising:
 - a working status detection module that detects a current working status of a printer specified as a destination of distribution according to the allocation information; and
 - a display control module that displays one window on a display device, the window including at least a field showing the allocation information and another field showing the current working status detected by said working status detection module.
- 15 45. A distributed printing control apparatus in accordance with claim 44, said distributed printing control apparatus further comprising:
 - a first control module that causes said display control module to carry out a display with regard to a print job, while one unit of print data specified by the print job is either in distributed printing or in a waiting queue.
- 20 46. A distributed printing control apparatus in accordance with claim 45, said distributed printing control apparatus further comprising:
- 25

a second control module that causes said display control module to carry out a display with regard to the print job, while the distributed printing of the unit of print data specified by the print job is concluded.

5 47. A distributed printing control apparatus in accordance with claim 46, said distributed printing control apparatus further comprising a switch that is operated to alternatively change over between the display by said first control module and the display by said second control module.

10 48. A distributed printing control apparatus in accordance with either one of claims 46 and 47, wherein said second control module allocates an order of collection to the respective printers by considering a sequence of collected resulting prints and displays the allocation in the window.

15 49. A distributed printing control apparatus in accordance with either one of claims 46 and 47, wherein said second control module displays in the window a switch for activating another cycle of distributed printing after conclusion of one cycle of distributed printing.

20 50. A distributed printing control apparatus in accordance with any one of claims 44 to 49, wherein the allocation information with regard to multiple print jobs, each representing the print data, is simultaneously displayed in the window.

25 51. A distributed printing control apparatus in accordance with any one of claims 44 to 50, said distributed printing control apparatus

comprising:

a distribution information setting module that displays an input window on said display device and sets diverse pieces of information with regard to distribution of the print data, based on input data from an input device,

5 wherein the allocation information is specified, based on the diverse pieces of information set by said distribution information setting module.

52. A distributed printing control method that groups print data of interest, which is to be printed, by a predetermined unit, specifies allocation of respective grouped parts of the print data to a plurality of printers as allocation information, and outputs the print data to said plurality of printers in a distributive manner based on the allocation information, said distributed printing control method comprising the steps of:

10 15 (a) detecting a current working status of a printer specified as a destination of distribution according to the allocation information; and
(b) displaying one window on a display device, the window including at least a field showing the allocation information and another field showing the current working status detected in said step (a).

20

53. A distributed printing control method that groups print data of interest, which is to be printed, by a predetermined unit, specifies allocation of respective grouped parts of the print data to a plurality of printers as allocation information, and outputs the print data to said plurality of printers
25 in a distributive manner based on the allocation information,

said distributed printing control method comprising at least one step

corresponding to the structure of a distributed printing control apparatus in accordance with any one of claims 45 to 51.

54. A computer readable recording medium in which a computer program used in a distributed printing control apparatus is recorded, said distributed printing control apparatus grouping print data of interest, which is to be printed, by a predetermined unit, specifying allocation of respective grouped parts of the print data to a plurality of printers as allocation information, and outputting the print data to said plurality of printers in a distributive manner based on the allocation information, said computer program causing a computer to attain the functions of:

(a) detecting a current working status of a printer specified as a destination of distribution according to the allocation information; and
15 (b) displaying one window on a display device, the window including at least a field showing the allocation information and another field showing the current working status detected by said function (a).

55. A computer readable recording medium in accordance with claim 54, wherein said computer program further causes the computer to attain the function of:

(c) carrying out a display with regard to a print job, while one unit of print data specified by the print job is either in distributed printing or in a waiting queue.

25 56. A computer readable recording medium in accordance with claim 55, wherein said computer program further causes the computer to attain the

function of:

(d) carrying out a display with regard to the print job, while the distributed printing of the unit of print data specified by the print job is concluded.

5

57. A computer readable recording medium in which a computer program used in a distributed printing control apparatus is recorded, said distributed printing control apparatus grouping print data of interest, which is to be printed, by a predetermined unit, specifying allocation of respective grouped parts of the print data to a plurality of printers as allocation information, and outputting the print data to said plurality of printers in a distributive manner based on the allocation information,

10 said computer program causing a computer to attain at least one function corresponding to the structure of a distributed printing control apparatus in accordance with any one of claims 47 to 51.

15 58. A computer program used in a distributed printing control apparatus, said distributed printing control apparatus grouping print data of interest, which is to be printed, by a predetermined unit, specifying allocation of respective grouped parts of the print data to a plurality of printers as allocation information, and outputting the print data to said plurality of printers in a distributive manner based on the allocation information, said computer program causing a computer to attain the functions of:

20 (a) detecting a current working status of a printer specified as a destination of distribution according to the allocation information; and
25 (b) displaying one window on a display device, the window including

FO0548 OT202660

at least a field showing the allocation information and another field showing the current working status detected by said function (a).

59. A distributed printing control apparatus, comprising:

5 a printer specification module that specifies multiple printers as destinations of distribution among all printers connecting with said distributed printing control apparatus to allow data transmission; and

10 a distribution control module that outputs print data of interest, which is to be printed, in a distributive manner to the multiple printers specified by said printer specification module,

15 said distribution control module comprising:

a printer selection module that, when any trouble arises in any of the multiple printers specified by said printer specification module, selects one printer immediately available for printing among all the printers except the printer with the trouble; and

20 a troubled-time output module that outputs a distributed portion of the print data to the printer selected by said printer selection module as an alternative printer for the printer with the trouble.

20 60. A distributed printing control apparatus in accordance with claim 59, wherein said printer selection module comprises an identification module that identifies type of each printer to select a printer of an identical or similar type with or to a type of the printer with the trouble.

25 61. A distributed printing control apparatus in accordance with claim 60, said distributed printing control apparatus further comprising:

a performance information input module that receives information on performances of the respective printers from printer drivers provided for respective types of all the printers,

5 wherein said identification module comprises a type specification module that specifies a printer of the identical or similar type, based on the information input into said performance information input module.

10 62. A distributed printing control apparatus in accordance with any one of claims 59 to 61, said distributed printing control apparatus further comprising:

a monitor module that monitors occurrence of any trouble in each of the multiple printers specified by said printer specification module,

15 wherein said distribution control module comprises an after-start-of-printing alternative control module, when said monitor module detects occurrence of any trouble in any of the multiple printers during a time period between a start of distributed output of the print data and completion of printing with each printer, outputs non-printed page data, which is included in a distributed portion of the print data output to the printer with the trouble, to the alternative printer.

20

63. A distributed printing control apparatus in accordance with claim 62, wherein said after-start-of-printing alternative control module outputs page data, which represents a message showing replacement of the printer, to the alternative printer.

25

64. A distributed printing control apparatus in accordance with any

one of claims 59 to 61, said distributed printing control apparatus further comprising:

a monitor module that monitors occurrence of any trouble in each of the multiple printers specified by said printer specification module,

5 wherein said distribution control module comprises a before-printing alternative control module, when said monitor module detects occurrence of any trouble in any of the multiple printers prior to a start of distributed output of the print data, outputs a portion of the print data, which is expected to be output to the printer with the trouble, to the alternative printer.

10

65. A distributed printing control apparatus in accordance with any one of claims 59 to 61, wherein said distribution control module comprises:

a printer reselection module that, when any trouble arises in the alternative printer, selects one printer immediately available for printing
15 among all the printers except the printer with the trouble; and

a module that outputs a portion of the print data in a distributive manner to the printer selected by said printer reselection module as a new alternative printer.

20 66. A distributed printing control apparatus in accordance with claim 59, wherein said printer selection module comprises:

a candidate printer selection module that selects at least one printer that is of an identical or similar type with or to a type of the printer with the trouble and is immediately available for printing, among all the printers
25 except the printer with the trouble; and

an alternative printer selection module that selects one printer

satisfying a predetermined condition out of the at least one printer selected by said candidate printer selection module.

67. A distributed printing control apparatus in accordance with claim 5 66, wherein said printer selection module further comprises:

a selection method specification module that specifies whether the selection of the alternative printer is carried out manually or automatically;
a manual printer selection module that, in response to specification of the manual selection by said selection method specification module, displays 10 a data input window on a display device and selects one printer among all the printers except the printer with the trouble, based on input data from an input device according to the display of the window; and
a module that, in response to specification of the automatic selection by said selection method specification module, activates said candidate 15 printer selection module and said alternative printer selection module.

68. A distributed printing control apparatus in accordance with either one of claims 66 and 67, wherein said candidate printer selection module comprises:

20 a first selection module that selects a printer of an identical type with a type of the printer with the trouble, among all the printers except the printer with the trouble; and
a second selection module that, when no printer is selected by said first selection module, selects a printer having a printing performance close 25 to that of the printer with the trouble, among all the printers except the printer with the trouble.

YODER-01200600

69. A distributed printing control apparatus in accordance with claim 68, wherein said distribution control module comprises:

5 a module that, when the printer selected by said second selection module is specified as the alternative printer, corrects the print data to make a resulting print obtained from the alternative printer substantially equivalent to a resulting print expected from the printer with the trouble.

70. A distributed printing control apparatus in accordance with any 10 one of claims 66 to 69, wherein said candidate printer selection module comprises:

a speed preference decision module that determines whether or not a speed preference mode is set for distributed printing; and

15 an under-speed-preference-mode selection module that selects one available printer regardless of type of the printer, when said speed preference decision module gives an affirmative answer.

71. A distributed printing control apparatus in accordance with any one of claims 66 to 70, wherein said alternative printer selection module 20 comprises:

a module that selects a printer of a highest printing speed among the at least one printer selected by said candidate printer selection module.

72. A distributed printing control apparatus in accordance with any 25 one of claims 59 to 61, said distributed printing control apparatus further comprising:

a display control module that displays a name of the printer selected by said alternative printer selection module on a display device.

73. A distributed printing control apparatus in accordance with claim 5 72, said distributed printing control apparatus further comprising:

a module that causes said display control module to give a display when the print data is either in distributed printing or in a waiting queue.

74. A distributed printing control apparatus in accordance with either 10 one of claims 72 and 73, said distributed printing control apparatus further comprising:

a module that causes said display control module to give a display when the distributed printing of the print data is concluded.

15 75. A distributed printing control apparatus in accordance with any one of claims 59 to 61, wherein said distribution control module comprises:

a module that corrects the print data to make a resulting print obtained from the alternative printer substantially similar to a resulting print expected from the printer with the trouble, when the alternative printer 20 is of a different type from a type of the printer with the trouble.

76. A distributed printing control method, said method comprising the steps of:

(a) specifying multiple printers as destinations of distribution among 25 all printers connecting to allow data transmission; and
(b) outputting print data of interest, which is to be printed, in a

distributive manner to the multiple printers specified in said step (a),

said step (b) comprising the steps of:

(b1) when any trouble arises in any of the multiple printers specified in said step (a), selecting one printer immediately available for printing
5 among all the printers except the printer with the trouble; and

(b2) outputting a distributed portion of the print data to the printer selected in said step (b1) as an alternative printer for the printer with the trouble.

10 77. A distributed printing control method in accordance with claim 76, wherein said step (b1) comprises the step of:

(b11) identifying type of each printer to select a printer of an identical or similar type with or to a type of the printer with the trouble.

15 78. A distributed printing control method that outputs print data of interest, which is to be printed, to multiple printers in a distributive manner, said distributed printing control method comprising at least one step corresponding to the structure of a distributed printing control apparatus in accordance with any one of claims 61 to 75.

20 79. A computer readable recording medium in which a computer program for controlling distributed printing is recorded, said computer program causing a computer to attain the functions of:

(a) specifying multiple printers as destinations of distribution among
25 all printers connecting to allow data transmission; and
(b) outputting print data of interest, which is to be printed, in a

distributive manner to the multiple printers specified by said function (a),

said function (b) comprising the functions of:

(b1) when any trouble arises in any of the multiple printers specified by said function (a), selecting one printer immediately available for printing

5 among all the printers except the printer with the trouble; and

(b2) outputting a distributed portion of the print data to the printer selected by said function (b1) as an alternative printer for the printer with the trouble.

10 80. A computer readable recording medium in accordance with claim 79, wherein said function (b1) comprises the function of:

(b11) identifying type of each printer to select a printer of an identical or similar type with or to a type of the printer with the trouble.

15 81. A computer readable recording medium in accordance with claim 80, wherein said computer program causes the computer to further attain the function of:

(c) receiving information on performances of the respective printers from printer drivers provided for respective types of all the printers,

20 said function (b11) specifying a printer of the identical or similar type, based on the information input by said function (c).

82. A computer readable recording medium in accordance with any one of claims 79 to 81, wherein said computer program causes the computer 25 to further attain the function of:

(d) monitoring occurrence of any trouble in each of the multiple

printers specified by said function (a),

 said function (b) further comprising the function of:

 (b3) when occurrence of any trouble is detected by said function (d) in
any of the multiple printers during a time period between a start of
5 distributed output of the print data and completion of printing with each
printer, outputting non-printed page data, which is included in a distributed
portion of the print data output to the printer with the trouble, to the
alternative printer.

10 83. A computer readable recording medium in accordance with claim
83, wherein said function (b3) outputs page data, which represents a message
showing replacement of the printer, to the alternative printer.

15 84. A computer readable recording medium in accordance with any
one of claims 79 to 81, wherein said computer program causes the computer
to further attain the function of:

 (d) monitoring occurrence of any trouble in each of the multiple
printers specified by said function (a),
 said function (b) further comprising the function of:
20 (b3) when occurrence of any trouble is detected by said function (d) in
any of the multiple printers prior to a start of distributed output of the print
data, outputting a portion of the print data, which is expected to be output to
the printer with the trouble, to the alternative printer.

25 85. A computer readable recording medium in accordance with any
one of claims 79 to 81, wherein said function (b) further comprises the

functions of:

(b3) when any trouble arises in the alternative printer, selecting one printer immediately available for printing among all the printers except the printer with the trouble; and

5 (b4) outputting a portion of the print data in a distributive manner to the printer selected by said function (b3) as a new alternative printer.

86. A computer readable recording medium in accordance with claim 79, wherein said function (b1) comprises the functions of:

10 (b11) selecting at least one printer that is of an identical or similar type with or to a type of the printer with the trouble and is immediately available for printing, among all the printers except the printer with the trouble; and

(b12) selecting one printer satisfying a predetermined condition out of 15 the at least one printer selected by said function (b11).

87. A computer readable recording medium in accordance with claim 86, wherein said function (b1) comprises the functions of:

20 (b13) specifying whether the selection of the alternative printer is carried out manually or automatically;

(b14) in response to specification of the manual selection by said function (b13), displaying a data input window on a display device and selecting one printer among all the printers except the printer with the trouble, based on input data from an input device according to the display of 25 the window; and

(b15) in response to specification of the automatic selection by said

function (b13), activating said function (b11) and said function (b12).

88. A computer readable recording medium in accordance with either one of claims 86 and 87, wherein said function (b11) comprises the functions
5 of:

(b111) selecting a printer of an identical type with a type of the printer with the trouble, among all the printers except the printer with the trouble; and

10 (b112) when no printer is selected by said function (b111), selecting a printer having a printing performance close to that of the printer with the trouble, among all the printers except the printer with the trouble.

89. A computer readable recording medium in accordance with claim 88, wherein said function (b) further comprises the function of:

15 when the printer selected by said function (b112) is specified as the alternative printer, correcting the print data to make a resulting print obtained from the alternative printer substantially equivalent to a resulting print expected from the printer with the trouble.

20 90. A computer readable recording medium in accordance with any one of claims 86 to 89, wherein said function (b11) further comprises the functions of:

determining whether or not a speed preference mode is set for distributed printing; and

25 selecting one available printer regardless of type of the printer, when it is determined that the speed preference mode is set.

91. A computer readable recording medium in accordance with any one of claims 86 to 90, wherein said function (b12) further comprises the function of:

5 selecting a printer of a highest printing speed among the at least one printer selected by said function (b11).

92. A computer readable recording medium in accordance with any one of claims 79 to 81, wherein said computer program causes the computer to further attain the function of:

10 (d) displaying a name of the printer selected by said function (b12) on a display device.

93. A computer readable recording medium in accordance with claim 15 92, wherein said computer program causes the computer to further attain the function of:

15 activating said function (d) to give a display when the print data is either in distributed printing or in a waiting queue.

20 94. A computer readable recording medium in accordance with either one of claims 92 and 93, wherein said computer program causes the computer to further attain the function of:

25 activating said function (d) to give a display when the distributed printing of the print data is concluded.

25 95. A computer readable recording medium in accordance with any

one of claims 79 to 81, wherein said function (b) further comprises the function of:

5 correcting the print data to make a resulting print obtained from the alternative printer substantially similar to a resulting print expected from the printer with the trouble, when the alternative printer is of a different type from a type of the printer with the trouble.

96. A computer program used for controlling distributed printing, said computer program causing a computer to attain the functions of:

10 (a) specifying multiple printers as destinations of distribution among all printers connecting to allow data transmission; and

 (b) outputting print data of interest, which is to be printed, in a distributive manner to the multiple printers specified by said function (a),

 said function (b) comprising the functions of:

15 (b1) when any trouble arises in any of the multiple printers specified by said function (a), selecting one printer immediately available for printing among all the printers except the printer with the trouble; and

 (b2) outputting a distributed portion of the print data to the printer selected by said function (b1) as an alternative printer for the printer with

20 the trouble.